

Claims:

1. Spot welding tongs (1) for robotic applications for the resistance welding of workpieces and, in particular, sheet metals, of the type including tong arms (3) which are each pivotally mounted on a base body (2) and adjustable by an actuating means (13) and to which electrode holders (4) for the electrodes (5) are fastened, and further including winding means (7) comprising a wind-off roller (10) and a wind-up roller (11) for winding off and on a strip (6) for the protection of at least one electrode (5), characterized in that the wind-off roller (10) and the wind-up roller (11) of the winding means (7) are arranged on the base body (2) or on the tong arm (3), and that at least one guiding groove (8) is provided on the tong arm (3) and/or on the electrode holder (4) for the guidance of the strip (6) along the tong arm (3).
2. Spot welding tongs according to claim 1, characterized in that means for guiding and deflecting the strip (6), in particular deflection pulleys and slide surfaces (9), are provided on the tong arm (3) and/or electrode holder (4).
3. Spot welding tongs according to claim 1 or 2, characterized in that the wind-off roller (10) and/or the wind-up roller (11) is coupled with a driving means (12) and, in particular, an electronically activatable motor.
4. Spot welding tongs according to one or several of claims 1 to 3, characterized in that the tong arm (3) is formed by a base section (15), and that side pieces (16) are arranged on either side of the base section (15) to project beyond the base section (15), and the thus formed depression is designed as a guiding groove (8) for the strip (6).
5. Spot welding tongs according to claim 4, characterized in that at least one cover plate (18) is arranged on the end sides (17) of the side pieces (16) to cover the guiding groove (8) formed between the side pieces (16).
6. Spot welding tongs according to one or several of claims 1 to 3, characterized in that the tong arm (3) is formed by a base section with the guiding groove (8) being incorporated in the base section (15).
7. Spot welding tongs according to one or several of claims 1 to 3, characterized in that the guiding groove (8) is formed by ad-

ditional guiding elements (19) which are provided, for instance slipped or screwed, on the tong arm (3) and/or electrode holder (4).

8. Spot welding tongs according to one or several of claims 1 to 3, characterized in that the tong arm (3) is comprised of several individual components (29) which are connected with one another in a manner that a hollow space (21) is formed in the center of the tong arm (3) for the guidance of the strip (6).

9. Spot welding tongs according to one or several of claims 1 to 8, characterized in that a braking device (22) is provided to fix and stretch the strip (6).

10. Spot welding tongs according to claim 9, characterized in that the braking device (22) is connected with a control unit (23).

11. Spot welding tongs (1) for robotic applications for the resistance welding of workpieces and, in particular, sheet metals, of the type including tong arms (3) which are each pivotally mounted on a base body (2) and adjustable by an actuating means and to which electrode holders (4) for the electrodes (5) are fastened, characterized in that the tong arms (3) are each comprised of a main element (24) which is prestressed by at least one drag strut or a drag rope (25).

12. Spot welding tongs according to claim 11, characterized in that at least one retaining plate (26) is arranged on the main element (24) of the tong arm (3), via which retaining plate the at least one drag strut or the drag rope (25) is guided in a spaced-apart relationship to the main element (24).

13. Spot welding tongs according to claim 11 or 12, characterized in that the main element (24) is formed by a round section.

14. Spot welding tongs according to one or several of claims 11 to 13, characterized in that the at least one drag strut, or the drag rope (25), is arranged on that side of the main element (24), on which the electrode holder (4) extends.

15. Spot welding tongs according to one or several of claims 11 to 14, characterized in that a holding strut or a holding rope (27) is provided in addition to the at least one drag strut or drag rope (25), respectively.

16. Spot welding tongs according to one or several of claims 11 to 15, characterized in that the at least one drag strut, or the drag rope (25), and/or the holding strut, or the holding rope

(27), are arranged at an angle of between 10° and 30° relative to the main element (24) of the tong arm (3).

17. Spot welding tongs according to one or several of claims 11 to 16, characterized in that the drag strut, or the drag rope (25), and optionally the holding strut, or the holding rope (27), extend from that side of the main element (24), to which the electrode holder (4) is attached, as far as to the opposite side of the base body (2) on the main element (24).

18. Spot welding tongs according to one or several of claims 11 to 17, characterized in that guiding grooves (8) are formed on the tong arms (3) to each receive a strip (6) for the protection of the electrodes (5) according to claims 1 to 10.